Fra Cristobal Desert Bighorn Sheep Management Memorandum 2006-2011

New Mexico Department of Game and Fish
Turner Endangered Species Fund

Background

In 1995, The New Mexico Department of Game and Fish (NMDGF) in cooperation with NM Ranch Properties, Inc. (NMRPI) transplanted 37 desert bighorn sheep (13 rams, 24 ewes) (*Ovis canadensis mexicana*) to the Fra Cristobal Mountains from the Red Rock captive facility. This herd was subsequently augmented in 1997 with 7 rams out of Red Rock (with the goal of reducing the number of rams in the captive facility). From 1995 to the present, NMDGF, NMRPI, and the Turner Endangered Species Fund (TESF) have jointly managed this desert bighorn sheep herd. A contractor was hired from the 1995 release until May 1996. From 1997 to 2002, two graduate students and several technicians were hired to study this herd, assessing habitat use and selection, and causes of lamb mortality (Bangs 2002, Bangs et al. 2005a, Bangs et al. 2005b, Parsons in prep.). In addition, Hornocker Wildlife Institute was contracted to monitor radio marked cougars as part of a study to examine desert bighorn sheep/cougar predator-prey relationships to further inform an adaptive desert bighorn sheep and cougar management plan (Wright et al. 2002). Since 2002, contract personnel have worked on desert bighorn sheep and cougars with funding provided by NMDGF, TESF, and the Foundation for North American Wild Sheep (TESF 2006).

By autumn 2002, the herd had increased to its highest level of approximately 75-80 individuals (NMDGF 2003). From 1995-2005, cougars were responsible for 83% (25 of 30 radiocollared adults) of the mortality on adult radiocollared desert bighorn sheep. From 1999-2002 an adaptive cougar and desert bighorn sheep management approach was followed whereby offending cougars were killed. In 2003, an experimental management plan to remove female cougars, and to radiocollar and monitor male cougars, was implemented (NMDGF files 2003). This action was to test the hypothesis that in the absence of female cougars, male cougars would not stay in desert bighorn sheep habitat and therefore would not kill desert bighorn sheep. Male cougars would be removed if they were documented to be a threat to desert bighorn sheep. The desert bighorn sheep population declined in 2003, and causes are attributed to a combination of cougar predation, diseases, and emigration to the adjacent Caballo Mountains.

An evaluation of habitat quality on the mountain was accomplished by Dunn (1994) and it was determined that approximately 65 square kilometers (km^2) of high quality habitat exists. This puts the current density of desert bighorn sheep at approximately 1 desert bighorn sheep/km^2. This estimate was compared to desert bighorn sheep densities in other mountain ranges in Arizona with extant desert bighorn sheep populations and determined to be one of the lowest densities known: 0.8 desert bighorn sheep/km^2 in the Mojave Desert, 3.0-3.6 desert bighorn sheep/km^2 in the San Andres Mountains, NM during the 1970s, and 19 desert bighorn sheep/km^2 in the Red Rock captive facility during years when supplemental feed was not provided (NMDGF files 2006). Habitat

quality on the mountain is likely high due to the low density of desert bighorn sheep in the Fra Cristobals. In addition, desert bighorn sheep group sizes, an indicator of habitat quality (Berger 1978), remains higher than or comparable to desert bighorn sheep in expanding populations in New Mexico (NMDGF files 2006).

In spring 2006, TESF/FNAWS/NMDGF began a comprehensive assessment of desert bighorn sheep and cougar data collected over the 10 years since the reintroduction began (TESF unpublished proposal to FNAWS). The goal of this assessment will be to inform cougar and desert bighorn sheep management over the short and long term. Desert bighorn sheep demographics and the primary factors affecting demographics will be analyzed over that period. The assessment is scheduled for completion in summer 2007.

Development of this management plan is indicated by section B.3. from the original Memorandum of Understanding (signed July 1995) that authorized the desert bighorn sheep restoration project.

Goal

To establish a viable, self sustaining herd of desert bighorn sheep in the Fra Cristobal Mountains to contribute to desert bighorn sheep recovery in New Mexico.

Critical Elements

1) Management actions for this herd will strive to increase population numbers to the point it is large enough to serve as a source herd for transplants to other areas in New Mexico.
2) The population should contribute to advancing research when it is compatible with the goal statement.
3) The population should support a limited hunt at some time in the future.

During the 5 year span of this Management Memorandum, the parties involved will work towards achieving this goal and critical elements. It is not intended that they will be achieved at the end of 5 years, only that progress and hence the Memorandum will be re-evaluated at that time.

Concurrence with other Planning Documents

This management goal and objectives are consistent with the original Memorandum of Understanding that authorized the desert bighorn sheep restoration project. They are also consistent with the *Strategic Plan New Mexico Department of Game and Fish FY 2006 through 2010* Objective 3. They are also consistent with many strategies in the *Plan for the Recovery of Desert Bighorn Sheep in New Mexico 2003-2013*, including Issue 2 Strategies 4 and 7.

Management Strategy

Desert bighorn sheep and cougars will be managed based on the size of the desert bighorn sheep herd. Therefore, 3 population sizes for female desert bighorn sheep greater than 1 year of age (i.e., ewes) that trigger differing levels of cougar control are

designated. This plan does not limit NMRPI's opportunity to take cougars through sport harvest regulations.

The number of ewes in the population will be assessed each year in March and September (see *Evaluating the management plan*).

The **desert bighorn sheep management area** is delineated by the portion of the Fra Cristobal Mountains above 5,000 ft in elevation, all of which is owned by NMRPI.

For the purposes of capturing, radio-collaring, or killing cougars, the **cougar management area** is defined as all of the private Ranch property plus an area, referred to as "the corridor", between western boundary of the ranch private property and the eastern bank of the Rio Grande River. TESF will obtain permission from any other landowners/managing agencies involved before setting foot snares or box traps in the corridor.

TESF will be responsible for obtaining permission form landowners/Agencies in GMU 20 before setting foot snares or box traps or pursuing cougars with hounds on their property.

TESF will be responsible for obtaining and following all specifications of the Scientific and Educational Collection Permit.

NMDGF has no oversight or liability with immobilization or other drugs. TESF is responsible for compliance with all DEA rules.

In the following descriptions, if a radiocollared cougar targeted for control leaves the desert bighorn sheep management area before being killed, it can be pursued with hounds or foot snares may be set elsewhere on the Ranch or other lands within GMU 20 if the owner/managing Agency provide permission. If an uncollared cougar targeted for control leaves the desert bighorn sheep management area, it may be pursued with hounds or foot snares may be set only within the cougar management area.

≤ 30 ewes in desert bighorn sheep population
Any cougar that enters the desert bighorn sheep management area for any length of time will be killed.

31-75 ewes in desert bighorn sheep population
Any female cougar that enters the desert bighorn sheep management area will be killed. Any male cougar that kills a desert bighorn sheep will be killed. Any radiocollared male cougar remaining in the desert bighorn sheep management area for greater than 96 hours (4 days) will be considered a threat to desert bighorn sheep and will be killed, even if he leaves the management area before he is caught.

≥ 76 ewes in the desert bighorn sheep population
Only cougars (both male and female) that kill desert bighorn sheep will be killed.

Source herd requirements

A minimum of 100 desert bighorn sheep containing a minimum of 50 ewes must remain on the mountain post-transplant. This topic will be detailed further as we approach the herd size requirement.

Since we intend to use the Fra Cristobal desert bighorn sheep herd as a source of animals for restoration projects throughout New Mexico, we do not anticipate a cessation of cougar control.

Monitoring

TESF will hire necessary personnel to monitor and manage desert bighorn sheep and cougars throughout the year.

Field tasks are listed in order of importance below.

- snaring cougars and removing them or radio-collaring for monitoring.
- monitoring radio-collared cougars, with the goal of establishing a good sense of their movements and habits. This will undoubtedly require extensive and intensive effort. At this point it is not practical to establish a minimum level of VHF telemetric contact that the field team needs to accomplish this task. TESF will endeavor to download cougars GPS collars at least 5 times weekly.
- monitoring desert bighorn sheep with a goal of hearing the radioed animals at least 3 times weekly. Any desert bighorn sheep death will be carefully investigated to determine cause. As time allows, visual observations will be made on desert bighorn sheep to count the total population and estimate sex and age structure.

NMDGF will attempt to maintain active radio-collars on ~ 25% of the desert bighorn sheep. A disproportionate number of these collars will be placed on ewes. The next helicopter net gun capture will occur in autumn 2007, and it is likely that captures may occur every other year after that. However, if it proves practical to capture desert bighorn sheep with dart guns, captures may occur sooner and more frequently. NMDGF will conduct desert bighorn sheep population surveys in May and October each year. To limit potential disturbance from repeated helicopter surveys, ground surveys will be emphasized. NMDGF will, however, use helicopters if data collected during a ground census are deemed insufficient.

Feeding

To provide the desert bighorn sheep herd with the best opportunity to increase in size, NMRPI may provide high protein horse feed (alfalfa pellets) may be provided during drought periods. Several feed sites will be established to prevent congregation in any given area. Habitat evaluation plots may be established to monitor the impacts of such a feeding program at key use areas

Funding

We anticipate that $35,000 to $45,000 will be required by the full-time biologist contracted for by TESF to accomplish most of the tasks above. Specifically, NMDGF will provide TESF with $25,000 for the period July 1, 2006 – June 30, 2007. Starting in

July 2007, NMDGF will endeavor to provide TESF with $35,000 for each July to June fiscal cycle through 2011. This is contingent upon sufficient appropriations and authorization being made by the Legislature of New Mexico to fund this agreement

In addition, NMDGF will provide personnel for desert bighorn sheep ground surveys, pay for any helicopter surveys deemed necessary including an emphasis on surveys in the adjacent Caballo Mountains to fully document the extent of emigration, and pay for desert bighorn sheep capture events including the helicopter, radiocollars and other equipment necessary for the trap. NMDGF will also provide 4 VHF radio-collars to be deployed on cougars.

TESF will contribute $10,000 for the period July 1, 2006 – June 30, 2007. Starting in July 2007, TESF will cover costs incurred by the field biologist when the $35,000 provided by NMDGF has been exhausted. TESF will provide housing and a vehicle for the field biologist. TESF will provide GPS collars for cougars.

Neither NMDGF, NMPRI, nor TESF shall have any financial obligation under this memorandum.

As practicable, the NMRPI will provide personnel for ground surveys.

NMDGF and TESF (and as practicable NMRPI) will provide biologists to assist with administrative and biological issues that may arise.

Contract

A contract will be executed each year between TESF and NMDGF to implement the activities set forth above. The scope of work and compensation will be based on this Management Memorandum.

Permit

Authorization to snare mountain lions will be given through a scientific and education permit. The language will be based on this Management Agreement. At the end of each calendar year, TESF will be responsible for submitting summary information to NMDGF. In addition, TESF will be responsible for renewing the permit when it expires.

Evaluating the Management Memorandum

Every 6 months (March and September), involved parties will participate in a telephone conference to discuss effectiveness of the management plan as it has unfolded on the ground. During these meetings, the number of ewes on the mountain will be discussed, modifications may be made to the plan, and additional issues that arise may be resolved. The team will meet in summer 2007 after the comprehensive 10-year assessment of desert bighorn sheep project is completed to adjust this plan accordingly. At a minimum, the involved parties should meet in person at the end of the 5 year period (March 2011) to write a new management plan for the herd.

Literature cited

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